

Claims

What is claimed is:

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1. A compound as shown in Figure 1, wherein:

a base unit consists of tris (8-quinolino)aluminum(III) (Alq3);

said base unit in the 3- or 4-position is substituted with an electron-donor group;

and

said base unit in the 5-position is simultaneously substituted with an

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electron-acceptor or p-delocalizing group.

2. The compound according to Claim 1, wherein said electron-donor group in

said 3- or 4-position is selected from a group consisting of -CR'R''R''', NR₂, and -OR,

wherein R, R', R'' = H or Alkyl, and R''' = Alkyl.

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3. The compound according to Claim 1, wherein said electron-acceptor or

p-delocalizing groups in said 5-position are selected from a group consisting of -CX₃,

-CX₂, -CX₃, -SO₃R, -CR=CR₂, -CX=CX₂, -COOR, -SO₃R, -SO₃M and -COOM,

whereby X=F, Cl, Br; R = H or Akyl, and M = metal ion.

4. The compound according to Claim 2, wherein said electron-acceptor or p-delocalizing groups in said 5-position are selected from a group consisting of -CX₃, -CX₂, -CX₃, -SO₃R, -CR=CR₂, -CX=CX₂, -COOR, -SO₃R, -SO₃M and -COOM, 5 whereby X=F, Cl, Br; R = H or Akyl, and M = metal ion.

5. The compound according to Claim 1, wherein said electron-donor group in the said 3- or 4-position is -CH₃ and said electron-acceptor group in said 5-position is -CF₃.

6. The compound according to Claim 1, wherein said electron-donor group in the said 3- or 4-position is -OR and said electron-acceptor group in said 5-position is -CF=CF₂.

7. The compound according to Claim 1, wherein said electron-donor group in the said 3- or 4-position is -CH₃ and said electron-acceptor group in said 5-position is -CF=CF₂.

8. A organic material having tris (8-quinolinato)aluminum(III) (Alq₃) as a base unit and wherein:

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said base unit in the 3- or 4-position is substituted with an electron-donor group;
and
said base unit in the 5-position is simultaneously substituted with an
electron-acceptor or p-delocalizing group.

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9. The material according to Claim 8, wherein said electron-donor group in said
3- or 4-position is selected from a group consisting of $-CR'R''R'''$, NR_2 , and $-OR$, wherein
 $R, R', R'' = H$ or Alkyl, and $R''' = Alkyl$.

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10. The compound according to Claim 8, wherein said electron-acceptor or
p-delocalizing groups in the said 5-position are selected from a group consisting of $-CX_3$,
 $-CX_2$, $-CX_3$, $-SO_3R$, $-CR=CR_2$, $-CX=CX_2$, $-COOR$, $-SO_3R$, $-SO_3M$ and $-COOM$,
whereby $X=F, Cl, Br$; $R = H$ or Akyl, and $M = metal\ ion$.

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11. The material according to Claim 9, wherein said electron-acceptor or
p-delocalizing groups in said 5-position are selected from a group consisting of $-CX_3$,
 $-CX_2$, $-CX_3$, $-SO_3R$, $-CR=CR_2$, $-CX=CX_2$, $-COOR$, $-SO_3R$, $-SO_3M$ and $-COOM$,
whereby $X=F, Cl, Br$; $R = H$ or Akyl, and $M = metal\ ion$.

12. The material according to Claim 8, wherein said electron-donor group in the said 3- or 4-position is -CH₃ and said electron-acceptor group in the said 5-position is -CF₃.

5 13. The material according to Claim 8, wherein said electron-donor group in said 3- or 4-position is -OR and said electron-acceptor group in said 5-position is -CF=CF₂.

14. The material according to Claim 8, wherein said electron-donor group in the said 3- or 4-position is -CH₃ and said electron-acceptor group in said 5-position is
10 -CF=CF₂.

15. An electroluminescent device comprising:
an anode,
an organic hole injecting and transporting zone,
15 an organic electron injecting and transporting zone;
a cathode; and
a luminescent layer of the compound shown in Figure 1, wherein said compound
is substituted in the 3- or 4-position with an electron-donor group and simultaneously
substituted in said 5-position with an electron-acceptor or a p-delocalizing group.

16. An electroluminescent device according to Claim 15, wherein said electron-donor group in the 3-or 4-positions is selected from the group consisting of -CR'R''R''', NR₂, and -OR, wherein R, R', R''=H or Alkyl and R'''=Alkyl.

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17. An electroluminescent device according to Claim 15, wherein said electron-donor or p-delocalizing groups in the 5-position are selected from the group consisting of -CX₃, -CX₂, -CX₃, -SO₃R, -CR=CR₂, -CX=CX₂, -COOR, -SO₃M, and -COOM, whereby X = F, Cl, Br; R = H or Alkyl and M = metal ion.

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18. An electroluminescent device according to Claim 16, wherein said electron-donor or p-delocalizing groups in the 5-position are selected from the group consisting of -CX₃, -CX₂, -CX₃, -SO₃R, -CR=CR₂, -CX=CX₂, -COOR, -SO₃M, and -COOM, wherein X = F, Cl, Br; R = H or Alkyl and M = metal ion.

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19. An electroluminescent device comprising:
an anode,
an organic hole injecting and transporting zone,
an organic electron injecting and transporting zone;

a cathode; and

a luminescent layer of tris(8-quinolinolato)aluminum(III) (Alq3), wherein said Alq3 is substituted in the 3- or 4-position with an electron-donor group and simultaneously substituted in said 5-position with an electron-acceptor or a p-delocalizing group.

20. An electroluminescent device according to Claim 19, wherein said electron-donor group in said 3-or 4-position is selected from the group consisting of -CR'R''R''', NR2, and -OR, wherein R, R', R'' = H or Alkyl and R''' = Alkyl.

21. An electroluminescent device according to Claim 19, wherein said electron-donor or p-delocalizing groups in said 5-position are selected from the group consisting of -CX3, -CX2, -CX3, -SO3R, -CR=CR2, -CX=CX2, -COOR, -SO3M, and -COOM, whereby X = F, Cl, Br; R = H or Alkyl and M = metal ion.

22. An electroluminescent device according to Claim 20, wherein said electron-donor or p-delocalizing groups in said 5-position are selected from the group consisting of -CX₃, -CX₂, -CX₃, -SO₃R, -CR=CR₂, -CX=CX₂, -COOR, -SO₃M, and -COOM, whereby X = F, Cl, Br; R = H or Alkyl and M = metal ion.

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